(12) UK Patent Application (19) GB (11) 2 359 498 (13) A

(43) Date of A Publication 29.08.2001

(21) Application No 0102168.2

(22) Date of Filing 29.01.2001

(30) Priority Data
(31) 0001991 (32) 29.01.2000 (33) GB

(71) Applicant(s)
Ian Gray
8 Knapp Park Road, Goodrington, PAIGNTON, Devon, TQ4 7LA, United Kingdom

(72) Inventor(s)
Ian Gray

(74) Agent and/or Address for Service
Ian Gray
8 Knapp Park Road, Goodrington, PAIGNTON, Devon, TQ4 7LA, United Kingdom

(51) INT CL[7]
A61H 3/02 , A63B 21/05

(52) UK CL (Edition S)
A6M MAG MEB
A5R R2

(56) Documents Cited
GB 2340402 A GB 0880960 A

(58) Field of Search
UK CL (Edition S) A5R R2 , A6M MAG MEA MEB
INT CL[7] A45B 9/00 , A61H 3/00 3/02 , A63B 21/05
Online : WPI, EPODOC, JAPIO

(54) Abstract Title
Shock absorber for walking aid

(57) A shock absorber mountable on the outside of a waking aid comprises a resilient mechanism 35 having at least one elastic component 24,25,26 wherein, the mount of tension and the degree of movement provided by the resilient mechanism can be varied. The shock absorber is fitted to the walking aid between one of the end projection 12 or 13 and a clip 29. The resilient mechanism 35 includes collars 14, 15 between the elastic components 24,25,26. Each elastic component 24,25,26 has a different size in cross section providing a different tension rating for each elastic component, such that the mount of tension in the resilient mechanism 35 can be varied by selecting a particular elastic component 24,25,26 or combination of components to be actively attached to the walking aid. Particular elastic components 24,25,26 are selected by using the clip 29 to fix the resilient mechanism to the walking aid at the collars 14, 15 or projections 12,13, thus in Figure 6 the resilient mechanism is shown fixed at projection 12 and projection 13 thereby selecting all the elastic components 24,25,26 for active use. The degree of movement within the resilient mechanism can be varied in a similar manner. The elastic components may be formed from coil springs, concertina shaped elastic material, a cylinder shaped elastic material or of strips of elastic material. The walking aid with the shock absorber fitted may be used to perform various exercises (Figures 10-23).

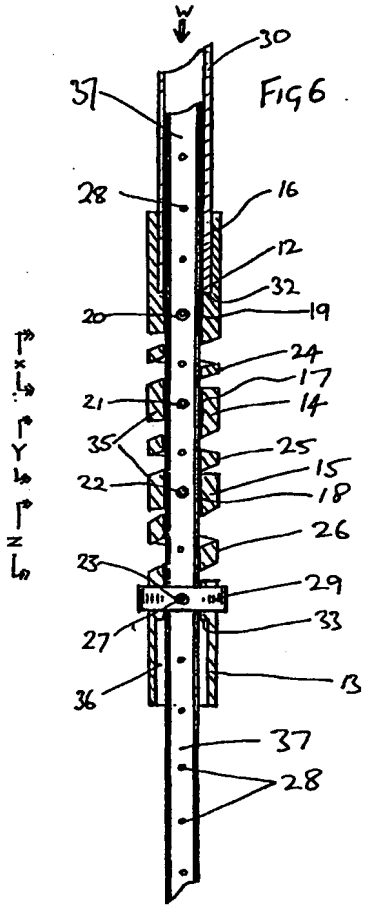


Fig 6

GB 2 359 498 A

FIG 1

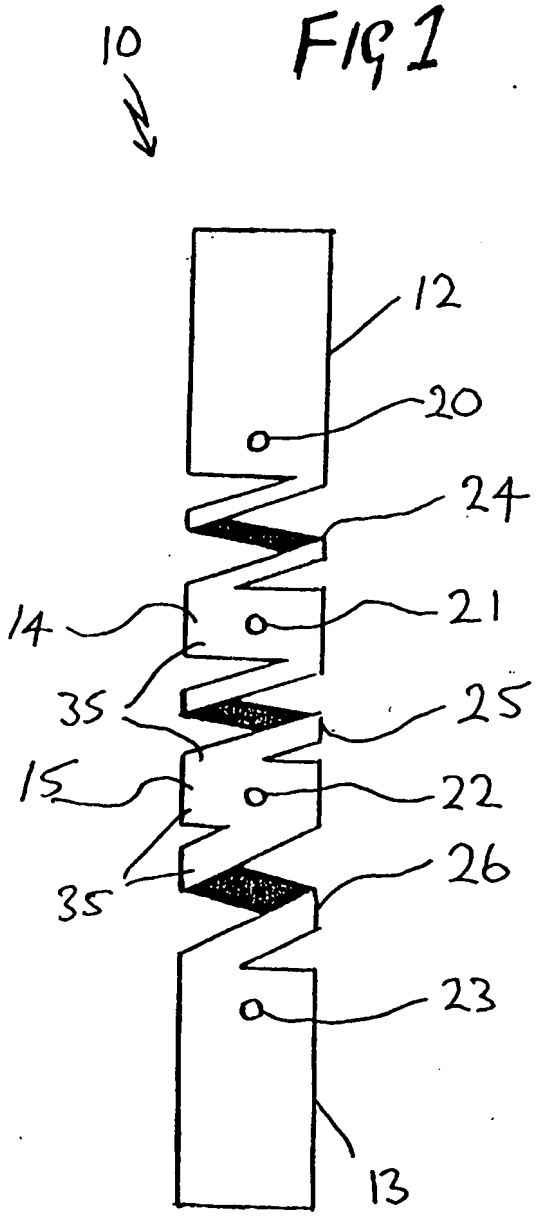
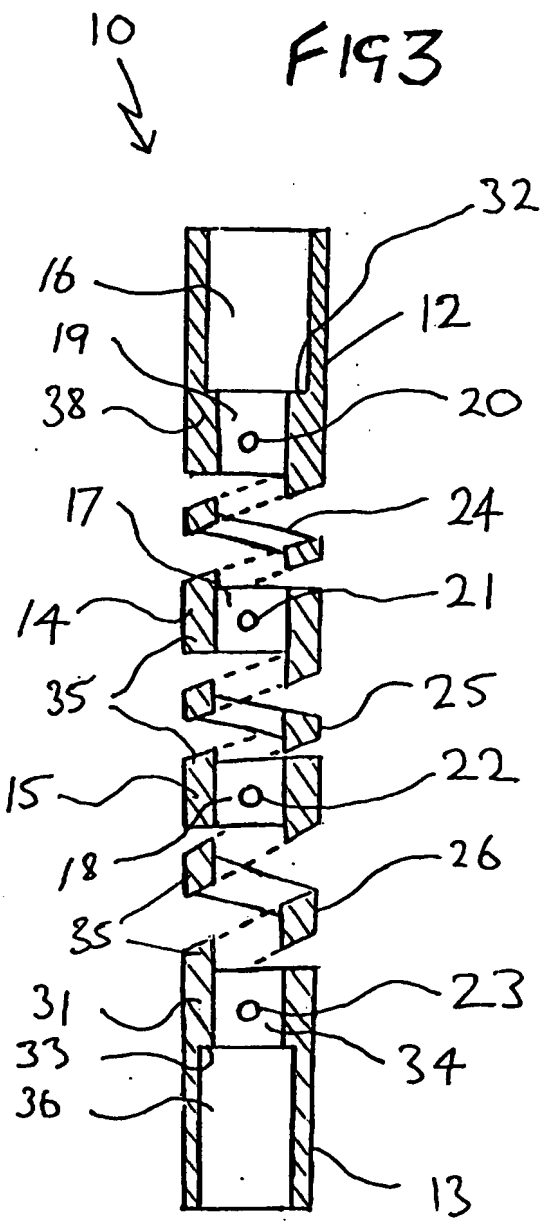


FIG 3



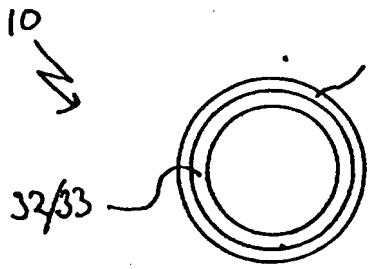


FIG 2

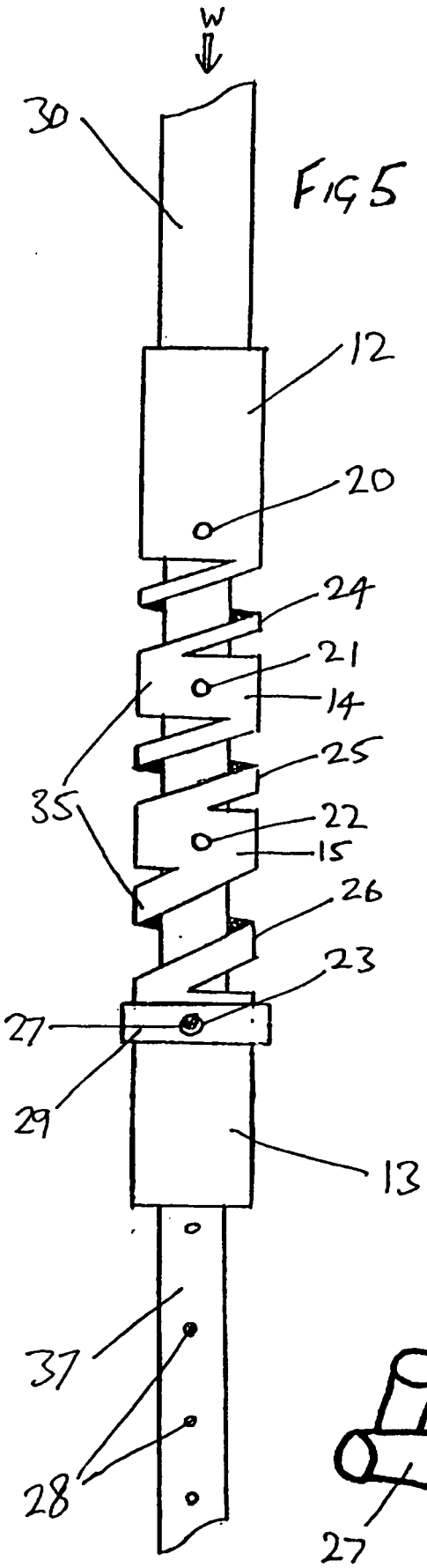
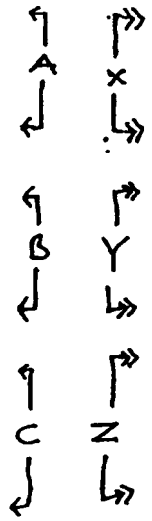


FIG 5



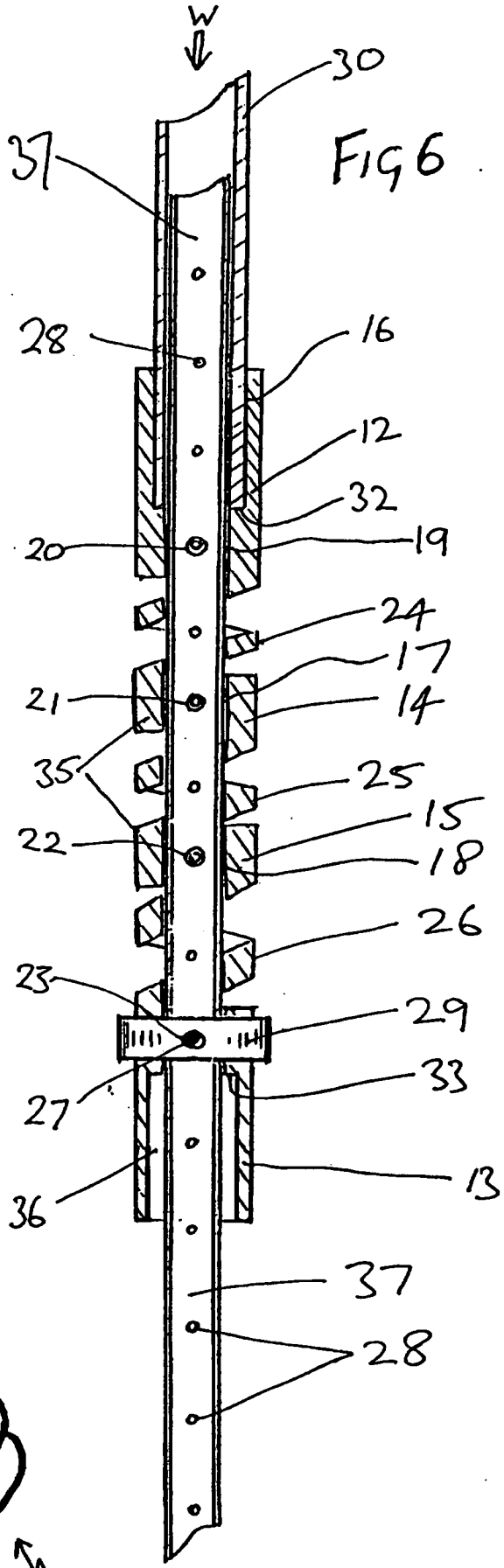


FIG 6

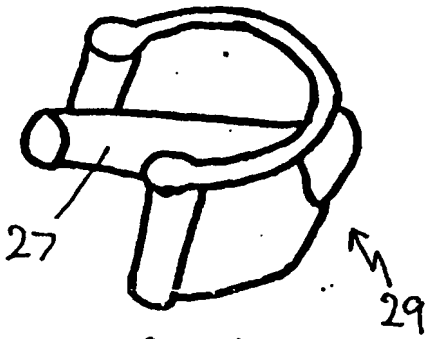


FIG 4

316

Fig 7

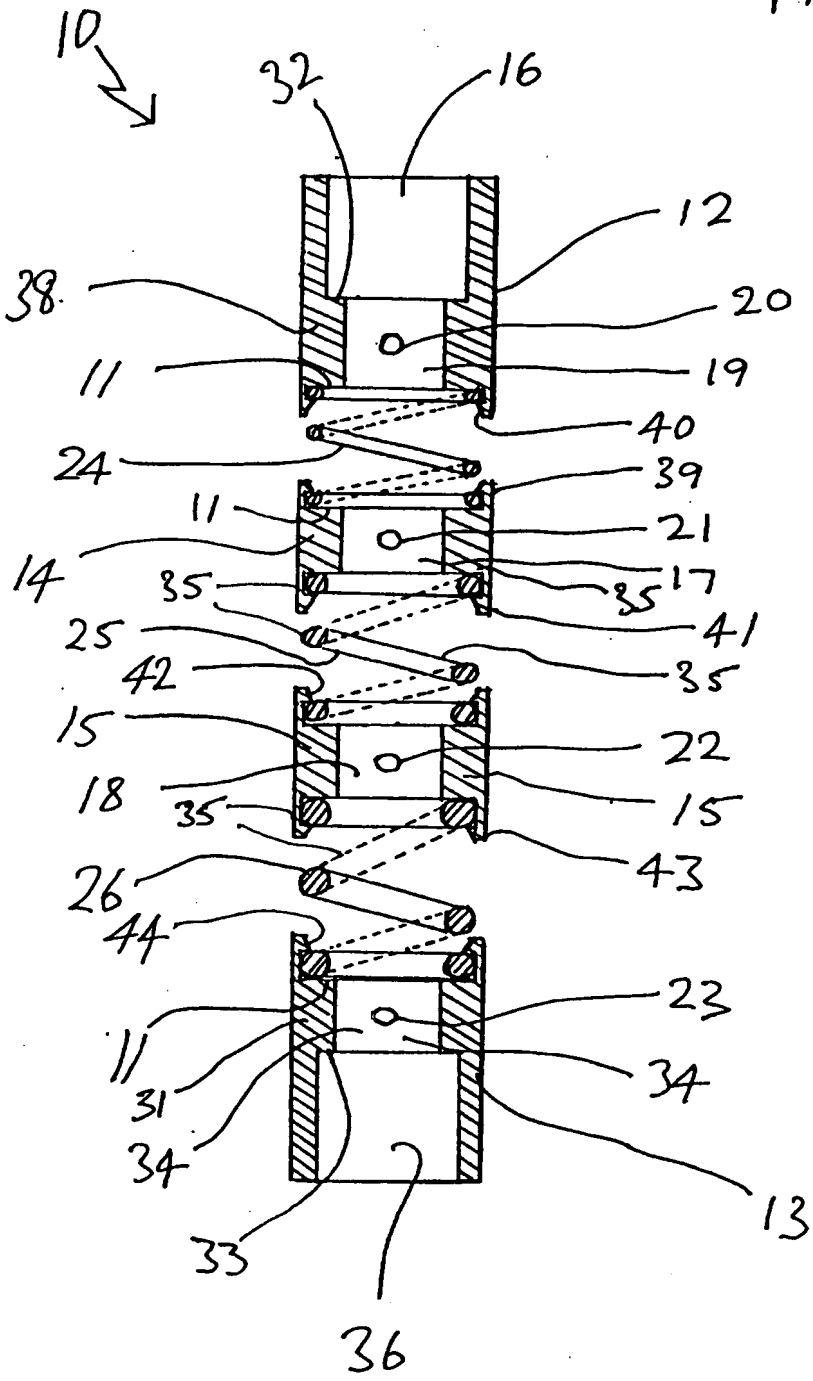

10
32
16
12
38
20
11
19
40
24
39
11
21
14
35
17
35
41
25
35
42
15
22
18
35
15
43
26
44
23
11
31
34
34
13
33
36

Fig 8

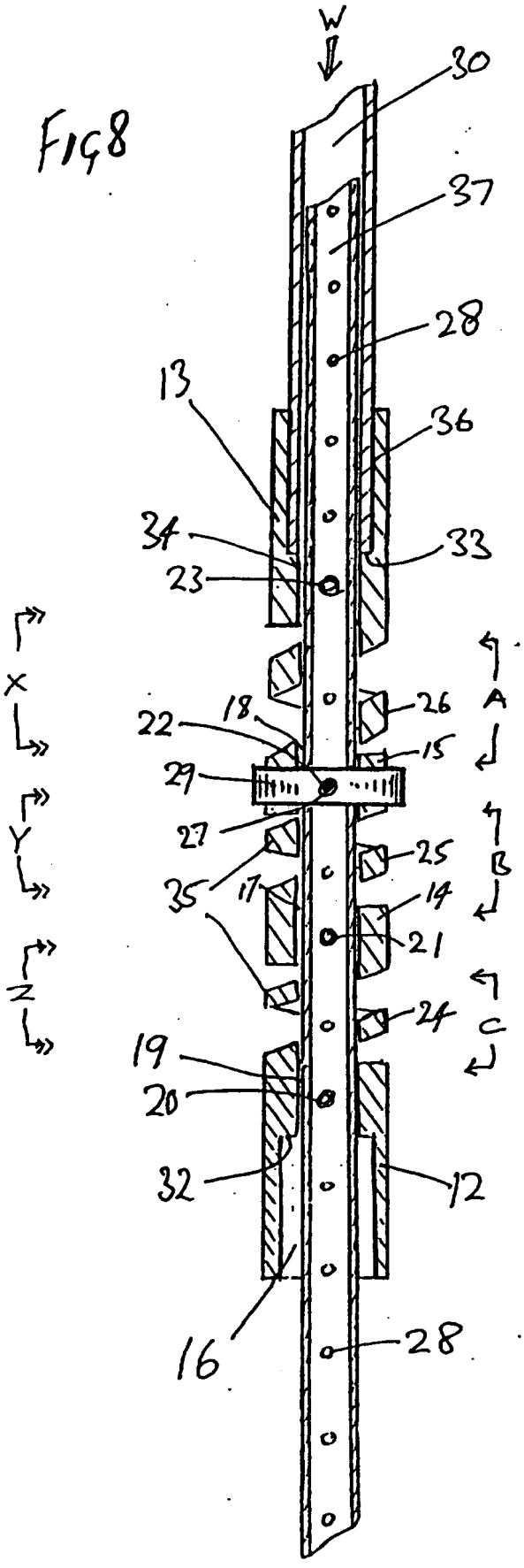

W
30
37
28
13
36
34
33
23
A
22
18
26
15
29
27
25
B
35
17
14
21
C
24
19
20
32
12
16
28
X
Y
Z

Fig 9

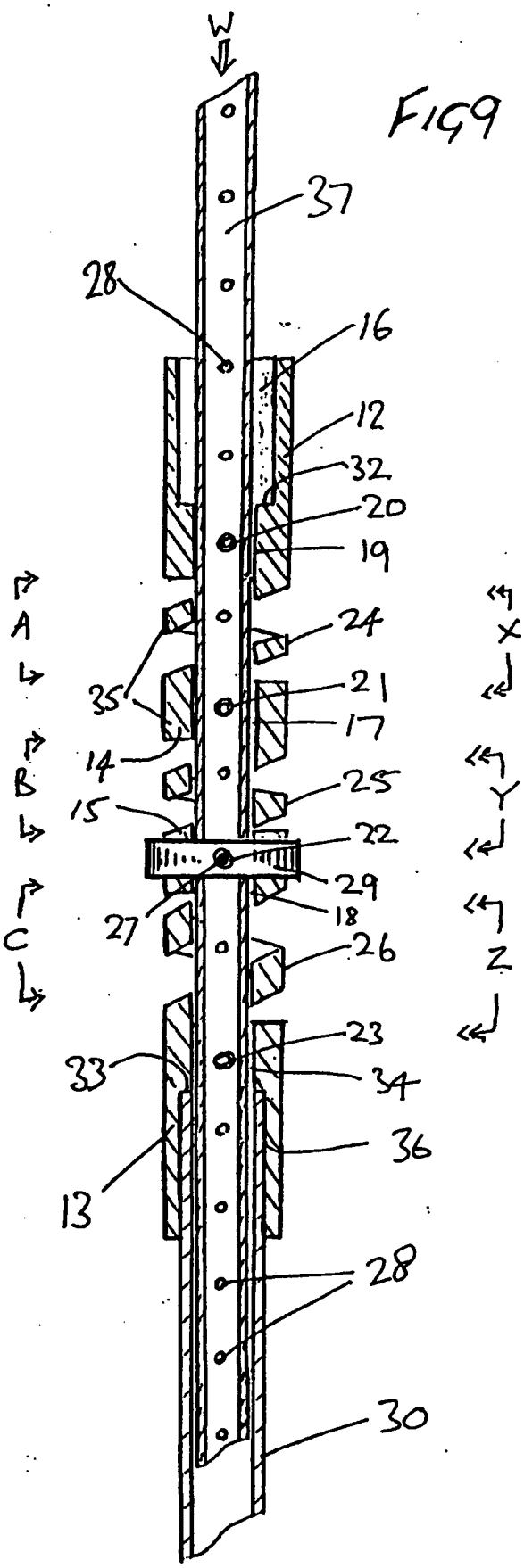

W
37
28
16
12
32
20
19
A
24
35
21
17
B
14
25
15
22
29
C
27
18
26
23
33
34
36
13
28
30
X
Y
Z

FIG 10

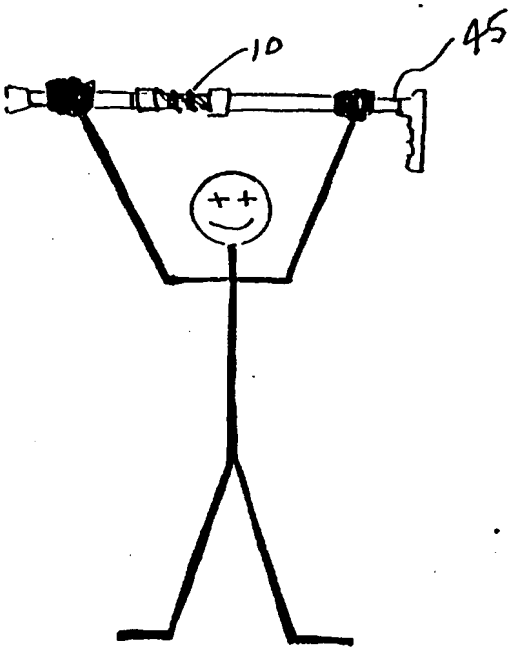


FIG 11

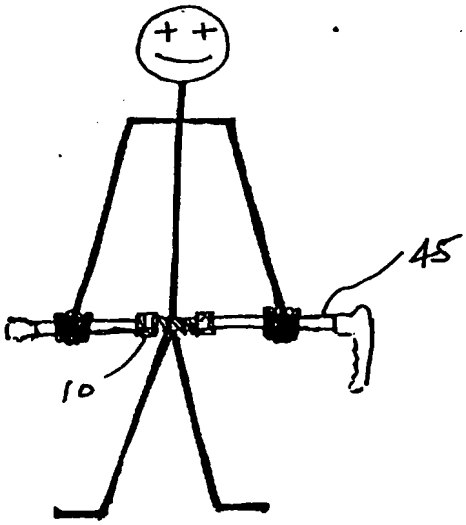


FIG 12

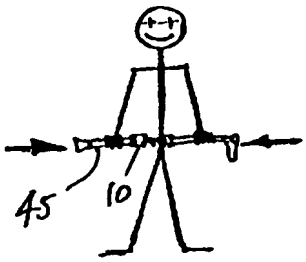


FIG 13

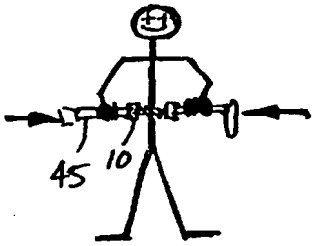
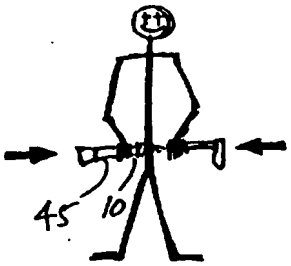


FIG 14



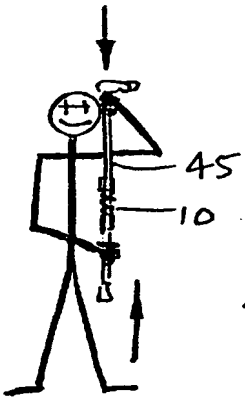


FIG 15

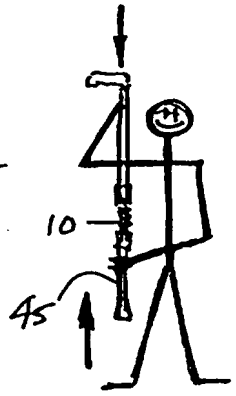


FIG 16

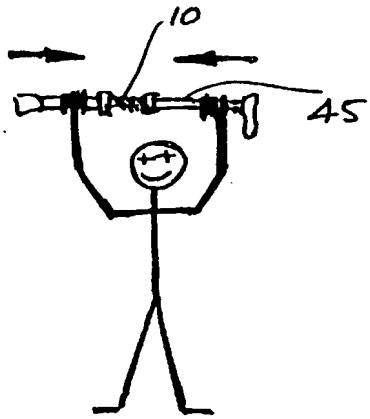


FIG 17

FIG 18

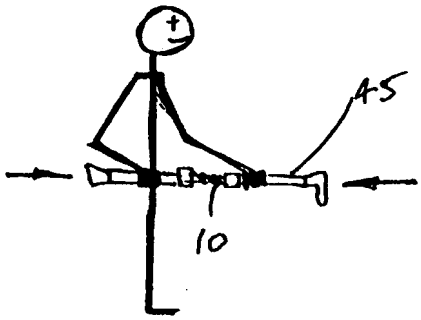


FIG 19

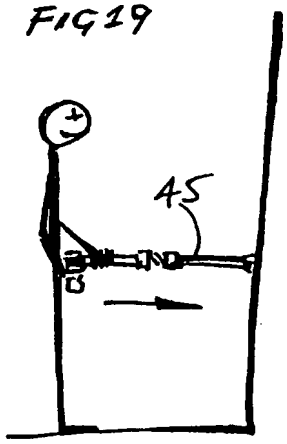


FIG 20

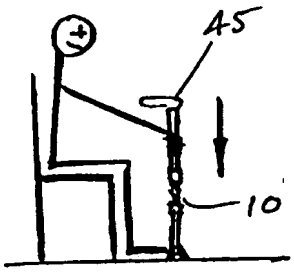


FIG 21

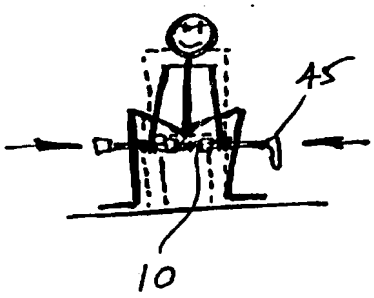
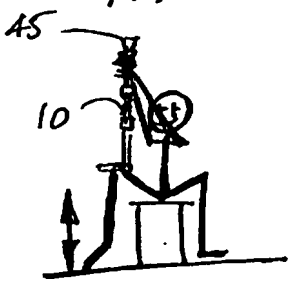


FIG 22



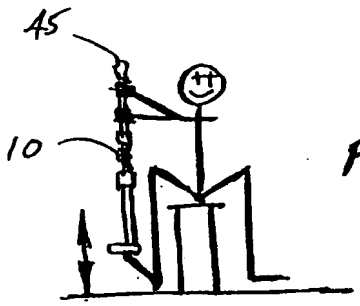


FIG 23

DEVICE FOR WALKING AIDS

This invention relates to a device for walking aids of the type which includes, or can incorporate, an arrangement of two tubes which are displaceable one inside the other, for example, though not limited to, walking sticks, crutches and walking frames.

Such walking aids are well known but suffer from the problem that, upon striking the ground a jarring sensation is sent through the hand and wrist which can continue up through the rest of the body. This can lead to injury to joints and other structures or worsen existing injuries or prevent them from recovering properly.

A further problem with such walking aids is that, due to their lack of resilience, as the user "steps through", the relative height of the walking aid increases as the walking aid becomes more vertical. This increase in relative height is absorbed by the bodily structures to a certain extent, but the user also has to raise the upper limb, by elevating and retracting the shoulder. Either way, further strain is imposed upon the joints and soft tissues.

Furthermore, another problem with such walking aids is that at the end of the "step-through" stage, and the user "pushes off", lifting the walking aid off the ground, the effort of doing so increases strain and tension further.

There have been attempts in the past to reduce the shock as such walking aids strike the ground by means of one or more sort of shock absorbing element attached to the walking aid. However, they all suffer from many problems and disadvantages due to their design, construction and manufacturing processes.

Such shock absorbing elements do not have a plurality of selectively variable different elastic tensions available within the same unit. If only one tension is available, it will not be suitable for everybody. For example, a frail old lady using a walking stick will probably only require a light tension in the mechanism, so anything more than that will produce pain and tension through the joints and soft tissues. Similarly, a young fit sportsman recovering from a lower limb injury, using a pair of elbow crutches, will require a medium to heavy tension in the mechanism, so anything less than that will be totally unsuitable.

Additionally, there are times when the user needs to be able to quickly and easily alter the tension within the mechanism. If this is not possible, it is a tremendous disadvantage. Even if, in some way, the elastic part of a certain tension could be exchanged for an elastic part of a different tension, it would be very difficult and sometimes impossible to perform by the average user, as well as time consuming.

Furthermore, the elasticity of such shock absorbing elements is such that one with a certain tension remains so throughout the available range of movement. This can be highly undesirable as, for example with a heavy tension, the initial impact will send a certain amount of shock through the body, which is defeating the object. A light tension can make the walking aid feel too weak and flimsy, especially to the heavier or more energetic person and, when the available movement within the mechanism "runs out", a shock is sent through the body, which is again defeating the object.

Such shock absorbing elements do not have a plurality of selectively variable different degrees of movement within the same unit, corresponding to different degrees of downward movement of the adapted walking aid. If only one degree of downward movement is available, it will not be suitable for everybody. For example, shorter people such as children and the elderly will only require a small degree of downward movement, whereas taller people will require a larger degree of downward movement. Also, the user may wish to change the amount of downward movement for whatever reason. Hence, if the correct degree of downward movement is not available, the adapted walking aid will become uncomfortable and unsafe.

If the user of the walking aid is new to the shock absorbing and resilient action, or perhaps if the terrain on which the user is walking is uneven, then it may be desirable to omit the shock absorbing and resilient action for a while. If this is not possible, then again, the walking aid will become uncomfortable, unsafe and may cause the user to lose confidence in the use of the walking aid.

Such shock absorbing elements can consist of a multitude of separate components, making them expensive both to manufacture and to buy. The individual components may have to be manufactured and distributed by different companies. Furthermore, the assembly of such shock absorbing mechanisms and their subsequent attachment to walking aids are laborious and time-consuming.

Moreover, the movement occurring between the individual components creates friction, leading to undue wear, noise and instability. This leads such shock absorbing mechanisms to become uncomfortable, unreliable and unsafe.

Due to the design and construction of such shock absorbing elements, it is highly unlikely that they can be produced entirely, or partly from plastics material. Therefore they are generally heavy, bulky and expensive. They also tend to suffer from problems such as corrosion due to moisture infiltration

The design and construction of some of the components of such shock absorbing elements also renders them totally unsuitable for manufacture using low-cost, mass production means such as injection moulding, compression moulding or other forms of moulding process. This excludes them from the many advantages that such manufacturing processes bring, such as the ability to alter the dimensions, construction and aesthetic features quickly and easily.

Such shock absorbing elements are also excluded from the possibility of being manufactured as a single, one-piece unit.

The design and construction of some such shock absorbing elements do not allow the relative movement that is possible between the two tubes of a walking aid to be utilised. To achieve the downward movement required, the mechanism becomes over-complicated, increasing expense further.

If the individual components of such shock absorbing elements are easily detachable from one another or from the walking aid itself, they may separate unexpectedly during normal use, with potentially disastrous consequences.

Such shock absorbing elements may not be suitable for different kinds of walking aids, such as sticks, crutches and walking frames. They are usually dedicated to only one kind of walking aid.

If the shock absorbing element cannot be fitted to standard, conventionally-designed walking aids, then a completely new walking aid will have to be designed and manufactured. And if the shock-absorbing mechanism cannot be fitted retrospectively to existing walking aids, then a completely new walking aid will have to be purchased.

Some such shock absorbing elements have the disadvantage whereby height adjustment of the walking aid is not possible, or becomes excluded or restricted.

Additionally, walking aids incorporating such shock absorbing elements are not suitable to be utilised as a form of exercise equipment which can be used to effectively exercise muscles throughout the user's body, whilst they are not being used specifically for mobility assistance.

Furthermore, if the shock absorbing element is located internally, and therefore neither readily visible nor accessible, then further problems arise. For example, its size will need to be limited, friction can occur between itself and the inside of the tubes, its condition cannot be ascertained, and difficulties will be encountered should any repair or replacement be necessary.

The aim of the present invention is to provide a device for walking aids which effectively solves the aforementioned problems of conventional walking aids and the above-mentioned problems and disadvantages of any previous shock absorbing elements.

Thus, it is an object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism.

More particularly, it is an object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism with at least one elastic tension and at least one degree of movement.

Accordingly, it is an object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism which has a plurality of selectively variable different elastic tensions within the same unit.

Additionally, it is a further object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism which has a plurality of selectively variable different amounts of movement occurring within the mechanism, producing a corresponding amount of relative movement occurring between the appropriate walking aid tubes.

Furthermore, it is another object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism in which the movement occurring within the mechanism can be omitted.

It is still another object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism which can be partly, or entirely manufactured from plastics material.

A further object of the present invention is to provide a device for walking aids incorporating a shock absorbing and resilient mechanism which can be partly, or entirely manufactured using low-cost, mass production means such as injection moulding, compression moulding or another form of moulding process.

Furthermore, it is an object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism which can, if required, be manufactured as a one-piece single unit.

Also, it is an object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism which remains external during use, and where its condition is visible.

It is a further object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism which is suitable for different kinds of walking aids, such as, but not limited to, walking sticks, crutches and walking frames.

Furthermore, it is an object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism which can be fitted to standard, conventionally-designed walking aids as well as to unusual or specially-designed walking aids.

Additionally, it is an object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism which can be retrospectively fitted to existing walking aids.

It is a further object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism in which a unit with one range of tensions, available movement, etc is quickly and easily exchangeable for one having a different range of tensions, available movement, etc.

It is an even further object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism which utilises the relative movement occurring between the tubes of the walking aid.

It is a further object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism which does not restrict the height adjustment of the walking aid.

Furthermore, it is another object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism in which any friction produced is minimal, therefore keeping any wear, noise and instability negligible, producing maximum comfort, reliability, and safety.

Additionally, it is a further object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism which allows the adapted walking aid to be used as an effective form of exercise equipment whilst not being used specifically for mobility assistance.

Furthermore, it is an object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism which provides sufficient resilience during the "step-through" stage of walking so that the relative increase in vertical height is effectively absorbed by the mechanism.

Also, it is an object of the present invention to provide a device for walking aids incorporating a shock absorbing and resilient mechanism which minimises the strain and tension during the "pushing-off" stage of walking.

It will be appreciated that all of the above, as well as other objects of the present invention, will be best understood from a complete reading of the disclosure.

According to the present invention, there is provided a device for any suitable walking aid, incorporating a shock absorbing and resilient mechanism, having at least one elastic component, at least one degree of movement available, means for selectively varying the elastic tension, means for selectively varying the degree of movement within the mechanism, at least one guide means for the appropriate walking aid tubes, means for securing said device onto said walking aid, means for securing said at least one elastic component to said device, the device being formed so that it can be fitted externally onto said walking aid, said shock absorbing and resilient mechanism remaining external during use of said walking aid.

The construction and mode of operation of the present invention, together with further advantages and features, will become apparent from the following description of embodiments, illustrated by way of non-limiting example, with reference to the accompanying drawings in which:

Figure 1 is an elevation view of the device according to the present invention in a first embodiment.

Figure 2 is a vertical plan view of the device according to the present invention in the first embodiment.

Figure 3 is a sectional view of the device according to the present invention in the first embodiment.

Figure 4 is a perspective exploded view of a standard E-clip.

Figure 5 is an elevation view of the device according to the present invention in the first embodiment, attached to the appropriate tubes of a walking aid.

Figure 6 is a sectional view of the device according to the present invention in the first embodiment, attached to the appropriate tubes of a walking aid.

Figure 7 is a sectional view of the device according to the present invention in a second embodiment.

Figure 8 is a sectional view of the device according to the present invention in the first embodiment, attached to the appropriate tubes of a walking aid in another way.

Figure 9 is a sectional view of the device according to the present invention in the first embodiment, attached to the appropriate tubes of a walking aid in a further way.

Figures 10 to 23 illustrate some examples of exercises that are possible with the device according to the present invention fitted to an appropriate walking aid, in this case a walking stick.

With reference to Figures 1, 2 and 3 of the drawings, the device 10 is cylindrical and comprises a shock absorbing and resilient mechanism 35, with a plurality of elastic parts 24, 25, and 26. A projection 12 is formed at one end of the device 10 and a projection 13 is formed at the other end of the device10. Between elastic part 24 and elastic part 25 is formed collar 14, with guide means 17. Between elastic part 25 and elastic part 26 is formed collar 15, with guide means 18. There is a hole 21 through collar 14 and a hole 22 through collar 15.

With reference to Figures 3, 6 and 7, projection 12 has a plurality of internal diameters. The wider part is in the form of a sleeve 16 which can house the lower end of the wider walking aid tube 30. The narrower part of projection 12 is in the form of a collar 38 which has hole 20 through. The cylindrical internal surface of collar 38 is formed so as to be a suitable guide means 19 for the narrower walking aid tube 37. The collar 38 of projection 12 is formed at one end as a shelf 32 upon which can rest the lowest end of the wider walking aid tube 30.

With reference to Figures 3, 8 and 9, projection 13 is similar to projection 12 and also has a plurality of internal diameters. The wider part is in the form of a sleeve 36 which can house the lower end of the wider walking aid tube 30. The narrower part of projection 13 is in the form of a collar 31 which has hole 23 through. The cylindrical internal surface of collar 31 is formed so as to be a suitable guide means 34 for the narrower walking aid tube 37. Collar 31 of projection 13 is formed at one end as a shelf 33 upon which can rest the lowest end of the wider walking aid tube 30.

Depending on requirements, either sleeve 16 of projection 12 or sleeve 36 of projection 13 can be chosen to house the lower end of the wider walking aid tube 30. If sleeve 16 is chosen to house the lower end of the wider walking aid tube 30, then the lowest end of the wider walking aid tube 30 will rest on shelf 32, transferring the weight W of the user from the walking aid to the device 10. If sleeve36 is chosen to house the lower end of the wider walking aid tube 30, then the lowest end of the wider walking aid tube 30 will rest on shelf 33.

Whilst one projection's sleeve is housing the lower end of the wider walking aid tube 30, the other projection's sleeve is empty. The cylindrical internal surface of the empty projection's collar continues to act as a guide means. Depending which sleeve is chosen, the cylindrical internal surface of collar 38 acts as guide means 19 or the cylindrical internal surface of collar 31 acts as guide means 34.

As shown in Figures 3 and 7, elastic parts 24, 25 and 26 have different sizes in cross-section. Elastic part 24 is smaller in cross-section than elastic part 25 which in turn is smaller in cross-section than elastic part 26. The smaller the cross-section, the lighter the tension. Hence, elastic part 24 has the lightest tension, elastic part 26 has the strongest tension, and elastic part 25 has the intermediate tension.

With reference to figures 4,5,6,8 and 9, the device 10 is attached via the holes 28 through the narrower walking aid tube 37, and the through-holes 20,21, 22 and 23 of the device. Each of the through-holes 20, 21, 22 and 23 line up with one of the holes 28 on the narrower walking aid tube 37. Standard E-clip 29 is used to secure the device 10 onto the walking aid by inserting the pin 27 of clip 29 through the appropriate holes.

As stated previously, either sleeve 16 of projection 12 or sleeve 36 of projection 13 can be chosen to accommodate the wider walking aid tube. However, the method of attachment of the device 10 onto the two walking aid tubes will now be described with reference to the drawings, as if sleeve 16 of extension 12 is chosen.

To attach the device 10 onto the two tubes 30 and 37 of a walking aid, the lower end of the wider tube 30 of the walking aid is simply inserted into sleeve 16 of projection 12 until it comes to rest against shelf 32 of collar38. The wider walking aid tube 30 should fit tightly within sleeve 16. An appropriate adhesive could be applied between the lower end of the wider walking aid tube 30 and sleeve 16 before inserting the lower end of the wider walking aid tube 30 into sleeve 16, if necessary. Next, the upper end of the narrower walking aid tube 37 is inserted through the device 10, via projection 13, guide means 34, elastic part 26, guide means 18, elastic part 25, guide means 17, elastic part 24, guide means 19, then up through the interior of the wider walking aid tube30. The height of the walking aid is then adjusted in the usual way via the appropriate hole 28 on the narrower walking aid tube 37 and hole 20, 21, 22 or hole 23 of the device 10, using the standard clip 29.

The device can be fitted during walking aid manufacture, onto walking aids at suppliers, distributors, retailers, at medical establishments or retrospectively onto existing walking aids. It can be fitted to any suitable walking aid, for example, though not limited to walking sticks, crutches and walking frames, whether conventionally-designed or specially-designed.

With specific reference to Figure 7, collars 14, 15, 31 and 38 can be suitably modified, to secure each of the ends of the elastic parts 24, 25 and 26, if the device 10 is not manufactured as a one-piece, single unit. In this example, the modification is in the form of sleeves 39 for elastic part 24, sleeves 41 for elastic part 25 and sleeves 43 for elastic part 26 with tapered catches 40 for elastic part 24, tapered catches 42 for elastic part 25 and tapered catches 44 for elastic part 26. To assemble, each of the end coils of elastic parts 24, 25 and 26 are pushed in place into the appropriate sleeves 39, 41 and 43. As pressure is applied, the end coils narrow, allowing them to be guided by the taperings. Upon reaching the end of the taperings, the end coils snap into place in the catches 40, 42 and 44. Each of the end coils of elastic parts 24, 25 and 26 rest on one of the shelves 11. An appropriate adhesive can be applied between the sleeves 39, 41 and 43, the shelves 11 and the end coils of elastic parts 24, 25 and 26.

Alternatively, other components can be incorporated in this case, for example, clips, pins, or other suitable means to secure the elastic elements to the collars.

With reference to Figures 5 and 6, the procedure for selecting the required tensions will now be described.

Selecting the required tensions is easily performed. To select tension A only, the clip is placed through hole 21. In this way only tension A of the device 10 is available, tensions B and C being omitted by the pin 27 of the clip 29 in hole 21. To select tensions A and B together, the clip 29 is placed through hole 22. In this way, only tensions A and B of the device 10 are available, tension C being omitted by the pin 27 of the clip 29 in hole 22. To select tensions A, B and C together, the clip 29 is placed through hole 23. In this way, tensions A, B and C of the device 10 are available.Hence, if A is the lighter tension, then it can be selected by placing pin of the clip through hole 21. If B is a medium tension then it can be selected along with A to have the two tensions combined by placing the pin of the clip through hole 22. If C is the heaviest tension then it can be combined along with A and B by placing the pin of the clip through hole 23.

Alternatively, if A is the heavier tension, it can then be selected in isolation by placing pin 27 of the clip 29 through hole 21. It can be combined with B or with both B and C.

Similarly, if A is the medium tension, it can then be selected in isolation, or combined with B or with both B and C.

A, B and C can each be either of a light, medium or heavy tension. Furthermore, more than one of the elastic parts can have the same tension, if required. So it will be appreciated that a plurality of tension variations are selectable.

Selecting the amount of movement occurring within the device, resulting in a corresponding amount of relative movement occurring between the appropriate tubes of the walking aid, is carried out in a similar way to the procedure for selecting the available tensions, and will now be described with reference to Figures 5 and 6.

X, Y and Z represent amounts of available movement occurring within the device 10. X, Y and Z can each be either a small, intermediate or large amount of available movement. For example, X can have a relatively small amount of available movement, Z a relatively large amount of available movement and Y an intermediate amount of available movement. So if only X is selected, then a correspondingly small amount of relative movement occurring between the walking aid tubes 30 and 37 will be available. If X and Y are selected in combination, then a corresponding amount of relative movement occurring between the walking aid tubes 30 and 37 will be available. And if X, Y and Z are selected in combination, then a corresponding amount of relative movement occurring between the walking aid tubes 30 and 37 will be available.

To select an amount, or a combination of movement, pin 27 of clip 29 is inserted through the appropriate hole 21, 22 or 23 of the device 10, and the amount of movement is chosen in a similar way as the tensions are chosen, as described earlier.

Furthermore, both degree of tension of the elastic part and the amount of relative movement of the walking aid tubes can be selected in combination. Hence, different degrees of tension can be selected, combined with different amounts of relative movement occurring between the two walking aid tubes 30 and 37 and vice versa. For example, as shown in Figures 5 and 6, extension 12 has been chosen to house the wider walking aid tube 30. Pin 27 of clip 29 has been inserted in hole 23. This will result in all three elastic tensions A, B and C being selected. It also results in all three amounts of movement, X, Y and Z being selected, giving the maximum amount of available movement.

With specific reference to Figure 8 of the drawings, extension 13 has been chosen to house the wider walking aid tube 30. Pin 27 of clip 29 has been inserted in hole 22. Here, only A, the strongest tension in this case has been selected. Also, only X, a relatively small amount of movement in this case, has been selected.

With specific reference to Figure 9 of the drawings, extension 13 has been chosen to house the wider walking aid tube 30. Pin 27 of clip 29 has been inserted in hole 22. In this case, the wider walking aid tube 30 is below the narrower walking aid tube 37, an arrangement found in some walking aids, for example walking frames. Here, only Z, a relatively small amount of movement in this case, has been selected. Also, only tension C, the strongest tension in this case, has been selected. If fitted to walking frames, generally one device 10 is fitted to each of the two rear sets of narrower and wider walking aid tubes 30 and 37.

If required, the relative movement occurring between the walking aid tubes 30 and 37 can be omitted, with no shock absorbing action or movement at all. If sleeve 16 of extension 12 is housing the wider walking aid tube 30, for example as shown in Figures 5 and 6 of the drawings, pin 27 of clip 29 is placed through hole 20. If sleeve 36 of extension 13 is housing the wider walking aid tube 30, for example as shown in Figures 8 and 9 of the drawings, then pin 27 of clip 29 is placed through hole 23. In each case, pin 27 of clip 29 prevents movement occurring between the wider walking aid tube 30 and the narrower walking aid tube 37. This function may be desirable in some situations, for example if a user is new to the shock absorbing and resilient action and needs to be introduced to it gradually.

The number of different elastic tensions is not limited. Hence, in other embodiments, a wider range of tensions can be made available, if required. Similarly, the number of different degrees of relative movement occurring between the two walking aid tubes is not limited. Also, there can be more than one elastic part of the same tension. Hence, the user can select little movement, with a weak tension, or a large movement, with a strong tension, and so on.

In further embodiments, the elastic parts can have a different shape in cross-section. For example, it can be round, square, elliptical, zigzag or any other suitable shape. Within the same elastic part, the helical coils can have different diameters in cross-section, or the coils can be arranged at different distances from one another, so that a plurality of tensions are available even within the same elastic part. The elastic parts can also be non-helical, without any coils, for example a concertina sort of shape, a flexible cylinder or strips of elastic material.

In even further embodiments, the sleeves of the projections could have a plurality of diameters corresponding to the different diameters of the wider walking aid tube. Similarly, the collars could have a plurality of internal diamcters, corresponding to the different diameters of the narrower walking aid tube. These modifications would allow the same device to be fitted to walking aid tubes having any diameter.

The materials used may be any that are required. However, it is envisaged that the device will be made at least partly from plastics material. The plastics material may be of any suitable sort, for example an Acetal plastic, an Acetal co-polymer plastic or a Delrin plastic.

As some, or all of the components of the device may be made from plastics material, they are suitable for manufacture by low-cost, mass-production means such as injection moulding, compression moulding or other forms of moulding process.

If the device is made entirely from plastics material, it can be produced as a single, one-piece unit. In this case, the entire unit is made from a plastics material such as those mentioned above, or an elastic form of those mentioned above.

It will be observed that the device according to the present invention provides sufficient resilience during the "step-through" stage of walking and minimises the strain and tension during the "pushing-off" stage of walking, as well as providing impact-absorbing properties to any suitable walking aid.

It will also be observed that the device utilises the relative movement occurring between the two walking aid tubes, but does not restrict the height adjustment of the walking aid.

The inventor, a Chartered Physiotherapist, has observed that an added feature of the device according to the present invention is that it allows the adapted walking aid to be used as an effective form of exercise equipment whilst not being used specifically for mobility assistance.

It is very important to maintain the fitness of an individual. The ability to select the degree of tension as well as the amount of movement within the mechanism makes the device ideal for adapting walking aids so that they can be used as an effective form of exercise equipment.

Muscles contract in three different ways, and can therefore be exercised in different ways. This is the most effective form of exercising muscles. A concentric contraction is where the muscle shortens, a static contraction is where the muscle is stationery and an eccentric contraction occurs when the muscle lengthens. Exercising with an adapted walking aid, with the device according to the present invention attached, can exercise muscles in this way throughout the body.

A wide variety of exercises can be performed, as Figures 10-23 illustrate. Here, a walking aid, in this case a walking stick 45, has the device 10 fitted. Generally, one grasps the narrower walking aid tube 37 in one hand, and the wider walking aid tube 30 in the other hand, then displaces them, one inside the other, compressing one or more of the elastic parts 24, 25 and 26 in the process. This exercises the muscles in all three ways - eccentrically, statically and concentrically. The tension, the variance of tensions, along with the amount of movement can be selected as described previously

It will be appreciated that the aim and objects set forth previously have been efficiently attained and, since changes, variations and modifications may be made in the construction and mode of operation of the device without departing from the scope of the invention, it is intended that all matter contained in the above description, and that which is within the range of equivalence, or shown in the accompanying drawings, shall be interpreted as illustrative and not in a limiting or restrictive sense.

CLAIMS

1. A device for any suitable walking aid, incorporating a shock absorbing and resilient mechanism, having at least one elastic component, at least one degree of movement available, means for selectively varying the elastic tension, means for selectively varying the degree of movement within the mechanism, at least one guide means for the appropriate walking aid tubes, means for securing said device to said walking aid, means for securing said at least one elastic component to said device, the device being formed so that it can be fitted externally onto said walking aid, said shock absorbing and resilient mechanism remaining external during use of said walking aid.

2. A device for walking aids according to claim 1 including means for omitting the movement within the mechanism.

3. A device for walking aids according to either claim 1 or claim 2 which can be partly, or entirely manufactured from plastics material.

4. A device for walking aids according to any of the preceding claims which can be manufactured as a one-piece single unit.

5. A device for walking aids according to any of the preceding claims wherein the shock absorbing and resilient mechanism is visible without dismantling.

6. A device for walking aids according to any of the preceding claims wherein a unit with one range of elastic tension and available movement is exchangeable with a unit with a different range of elastic tension and available movement.

7. A device for walking aids according to any preceding wherein the securing means for attaching the at least one elastic component to the device includes at least one collar.

8. A device for walking aids according to any preceding claim wherein the securing means for attaching the at least one elastic component to the device includes at least one collar with a tapered catch.

9. A device for walking aids according to any preceding claim wherein the securing means for attaching the device to the walking aid includes a pin, a double-pinned spring clip, C-clip or E-clip.

10. A device for walking aids according to any preceding claim wherein the securing means for attaching the device to the walking aid allows the device to be retrospectively fitted to existing walking aids.

11. A device for walking aids according to any preceding claim wherein the securing means for attaching the device to the walking aid is adaptable to allow the device to be fitted to different kinds of walking aids.

12. A device for walking aids according to any preceding claim wherein the securing means for attaching the device to the walking aid includes at least one hole through the device.

13. A device for walking aids according to any preceding claim wherein the means for attaching the device to the walking aid includes at least one projection either end of the device for receiving a walking aid tube.

14. A device for walking aids according to any preceding claim wherein the at least one projection either end of the device for receiving a walking aid tube has a shelf for the end of the walking aid to rest against and transfer the user's weight from the walking aid tube to the device.

15. A device for walking aids according to any preceding claim including means for adjusting the length of the adapted walking aid.

16. A device for walking aids according to any preceding claim wherein the technical features allow the adapted walking aid to be used as an effective form of exercise equipment whilst not being used specifically for mobility assistance.

17. A device for walking aids according to any preceding claim wherein the at least one elastic component is round, square, rectangular, elliptical or zigzag in cross-section.

18. A device for walking aids substantially as herein described, and illustrated with reference to the accompanying drawings.

Application No: GB 0102168.2
Claims searched: 1-18

Examiner: Paul Makin
Date of search: 25 June 2001

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): A6M (MAG, MEA, MEB) : A5R[A-F] (R2)

Int Cl (Ed.7): A45B 9/00 ; A61H 3/00, 3/02 ; A63B 21/05

Other: Online : WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X,E	GB 2340402 A	(GRAY) see particularly lines 12-15, page 3 and lines 27-31, page 7.	1,2,3,5-17
X	GB 880960	(BESSANT) see particularly lines 62-65, page 3.	1,5,15,17

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.